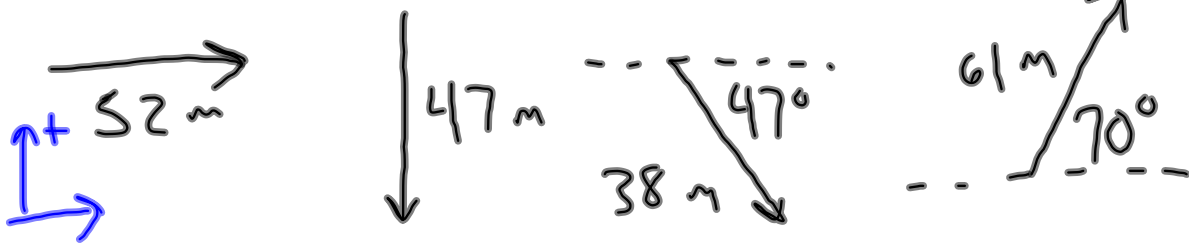


Quiz on Vectors tomorrow!



$$A_x = 52 \text{ m}$$

$$B_x = 0 \text{ m}$$

$$C_x = (38 \text{ m}) \cos(47^\circ)$$

$$+ D_x = (61 \text{ m}) \cos(70^\circ)$$

$$E_x = 98.8 \text{ m}$$

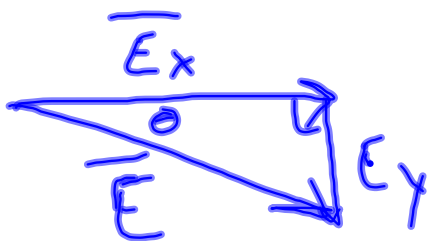
$$A_y = 0 \text{ m}$$

$$B_y = -47 \text{ m}$$

$$C_y = -(38 \text{ m}) \sin(47^\circ)$$

$$+ D_y = (61 \text{ m}) \sin(70^\circ)$$

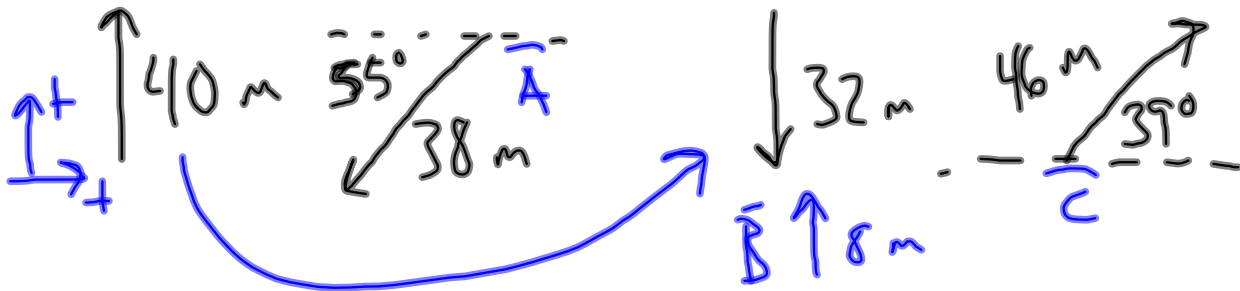
$$E_y = -17.5 \text{ m}$$



$$E = 100.3 \text{ m}$$

$$\theta = 10^\circ \text{ S of E}$$

$$\vec{E} = 100.3 \text{ m } @ 10^\circ \text{ S of E}$$



$$A_x = -(38 \text{ m}) \cos(55^\circ) \quad A_y = -(38 \text{ m}) \sin(55^\circ)$$

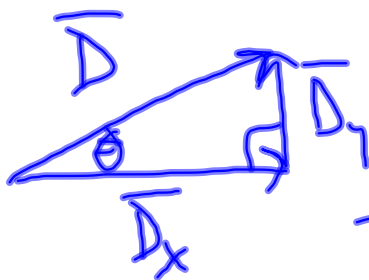
$$B_x = 0 \text{ m} \quad B_y = 8 \text{ m}$$

$$+ C_x = (46 \text{ m}) \cos(39^\circ)$$

$$+ C_y = (46 \text{ m}) \sin(39^\circ)$$

$$D_x = 14.0 \text{ m}$$

$$D_y = 5.82 \text{ m}$$



$$D = 15.2 \text{ m}$$

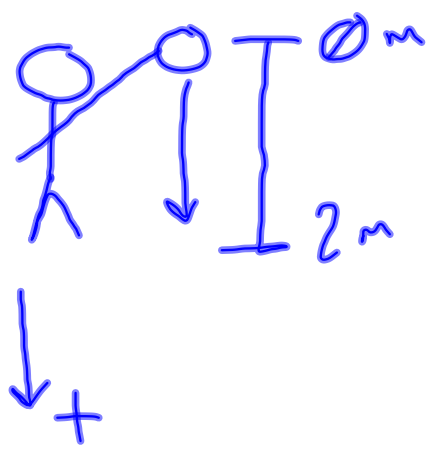
$$\theta = 22.6^\circ \text{ N of E}$$

$$\vec{D} = 15.2 \text{ m} @ 22.6^\circ \text{ N of E}$$

Free-fall:

- In the y-direction
- Only acceleration is due to gravity
- $a_y = g = 9.8 \text{ m/s}^2$

Jason drops a volleyball from 2.0 m above the floor. How long will it take before the ball hits the ground?



The diagram shows a stick figure on the left. A vertical line with a downward arrow indicates a height of 2.0 m from the figure's hand to the ground. A circle representing a ball is at the top of this line. A downward arrow with a '+' sign is next to the ground line.

$$a_g = 9.8 \text{ m/s}^2 \quad V_i = 0 \text{ m/s}$$
$$\Delta y = \cancel{V_i t} + \frac{1}{2} a_g t^2$$
$$t = \sqrt{\frac{2\Delta y}{a_g}}$$
$$= \sqrt{\frac{2(2 \text{ m})}{9.8 \text{ m/s}^2}}$$
$$= 0.639 \text{ s}$$

Jason then hits the volleyball so that it moves with an initial velocity of 6.0 m/s straight up.

- What is the maximum height that the ball reaches?
- How long does it take to reach the maximum height?
- How long does it take for the ball to reach the floor?